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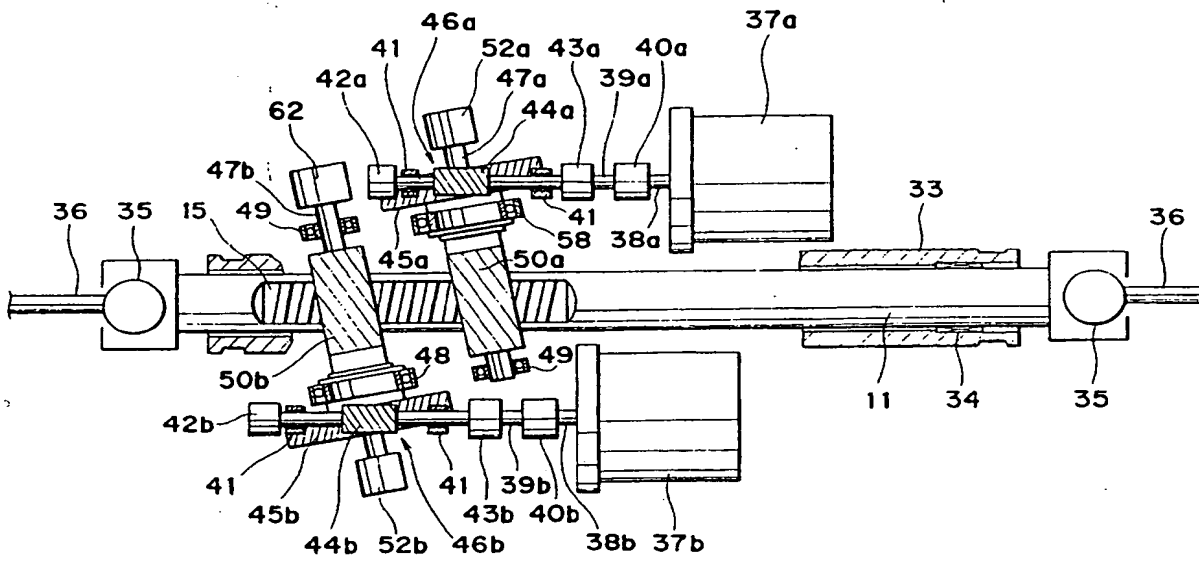
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(54) **Electric four-wheel steering system.**

(57) An electric four-wheel steering system according to the present invention comprises a rear wheel output shaft (11) for applying a steering angle associated with a quantity of displacement in the axial direction to rear wheels, a first electric motor (37a), a first speed reducer (46a) placed between the first electric motor and the rear wheel output shaft to displace the rear wheel output shaft in the axial direction when the first electric motor conducts, a second electric motor (37b), a second speed reducer (46b) placed between the second electric motor and rear wheel output shaft to displace the rear wheel

output shaft in the axial direction when the second electric motor conducts, and a control for controlling the first and second electric motors and allowing the electric motors to displace the rear wheel output shaft in the axial direction. In the first and second speed reducers, reverse transmission efficiency or efficiency in transmitting the movement of the rear wheel output shaft to the first and second electric motors is lower than forward transmission efficiency or efficiency in transmitting the rotations of the first and second electric motors to the rear wheel output shaft.

FIG. 1





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## EUROPEAN SEARCH REPORT

Application Number

EP 92 11 1035

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	US-A-4 741 409 (WESTERCAMP et al.) * abstract *	1	B 62 D 7/15
A	J. VOLMER: "GETRIEBE TECHNIK LEITFADEN" Chapter 8: "Schraubengetriebe", pages 301-306, 1978, Vieweg, Braunschweig, DE * paragraph 8.3.3.; figure 8.5. "	1	
X, P	EP-A-0 475 742 (MAZDA MOTOR) * claims 1,2; figures 12-14 *	1	
			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 62 D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
BERLIN		09-09-1992	BROYDE M P
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document	

EPF FORM 1500 (01.81) (P0401)



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### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

- ☐ All claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid.
- namely claims:
- ☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### X LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirement of unity of invention and relates to several inventions or groups of inventions.

namely:

1. Claim 1: A four wheel steering (4WS) having two speed reducers for which reverse transmission efficiency is lower than direct transmission efficiency.
2. Claims 2,3: A 4WS enabling control of a rear wheel steering motor when redundant control signals have equal values.
3. Claim 4: A 4WS having a procedure for resetting the rear wheels to a neutral position.
4. Claim 5: A 4WS having a control of the steering motor depending on the state of the battery.
5. Claim 6: A 4WS with two unidirectional clutches activated in case of failure.

- ☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.
- ☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid.
- namely claims:
- ☒ None of the further search fees has been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims.

namely claims:

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